

WARNING! This product contains functional sharp points that can cause injury if mis-used.

WARNING! Improper connections may cause serious injuries such as burns and explosions of batteries.

WARNING! Only for use by children aged 8 years and older.

Important! Read, observe and follow ALL the instructions in the manual.

Please remove all packaging and packing and tags and wires before giving this toy to your child.



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The purpose of the crossed-out wheellie bin symbol is to remind us that most electrical product and batteries contain trace elements which could be harmful to our environment and therefore our health. We must all be careful to dispose of them responsibly in a specifically designated way – either using a collection scheme or into the correctly labelled civic amenity (NOT into general waste). This will help your local authority to arrange to recycle or dispose of them in the appropriate manner.

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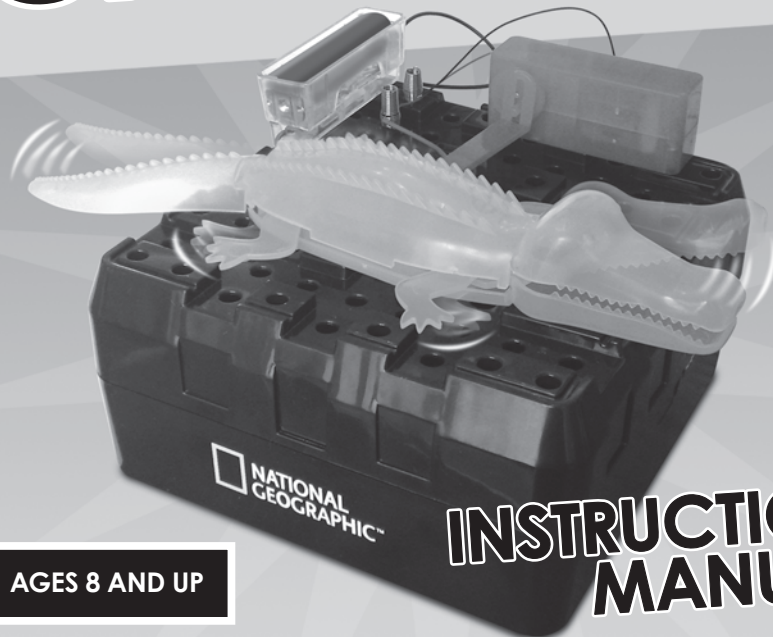
Item no. NG 78

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Please retain the information in this manual for future reference. Colour, designs and decorations may vary from those shown in the photographs.

 NATIONAL GEOGRAPHIC™

CROCODILE

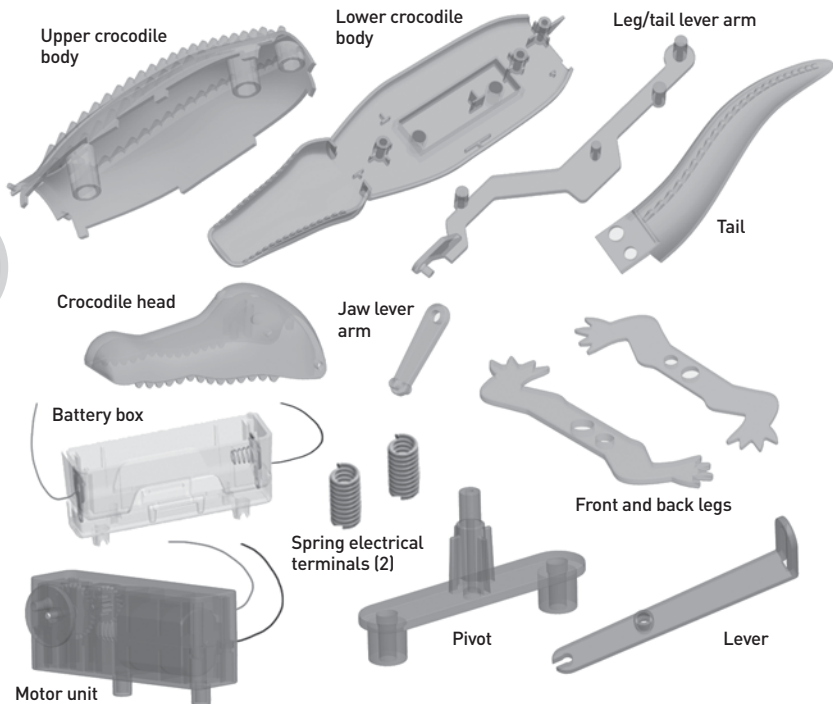


INSTRUCTION MANUAL

AGES 8 AND UP

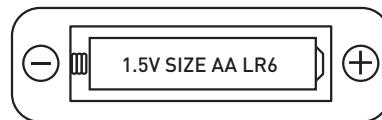
For children ages 8 years and up (adult assistance will be required). Read, observe and follow ALL the instructions in the manual.

CONTENTS



IMPORTANT INFORMATION! SAFE BATTERY INSTALLATION

- Only adults should replace batteries.
- Requires one AA (LR6) 1.5V battery (not included).
- Always use fresh batteries.
- Do not mix old and new batteries.
- Do not mix batteries of different types.
- Do not use rechargeable batteries.
- Non rechargeable batteries are not to be recharged.
- Batteries are to be inserted with the correct polarity.
- Do not short-circuit the supply terminals.
- Remove exhausted batteries and dispose of them properly.
- When toy is not in use, remove the batteries to prevent possible leakage.
- Use only recommended or equivalent battery types.
- Do not dispose of batteries in fire – they may explode or leak.
- Do not take a battery apart.
- When removing batteries, always pivot from the positive end of the battery to avoid damaging the springs.



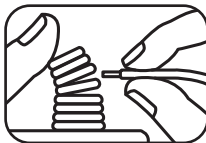
SAFETY

- When connecting the wires, always follow the instructions in this manual, as this will reduce the possibility of damage to the crocodile caused by incorrect wiring.
- Install the battery only after you have connected the wires and checked them. After using and/or disassembling the crocodile, remove the battery before you remove the wires.
- **DO NOT** use any components or parts other than those included with the crocodile.

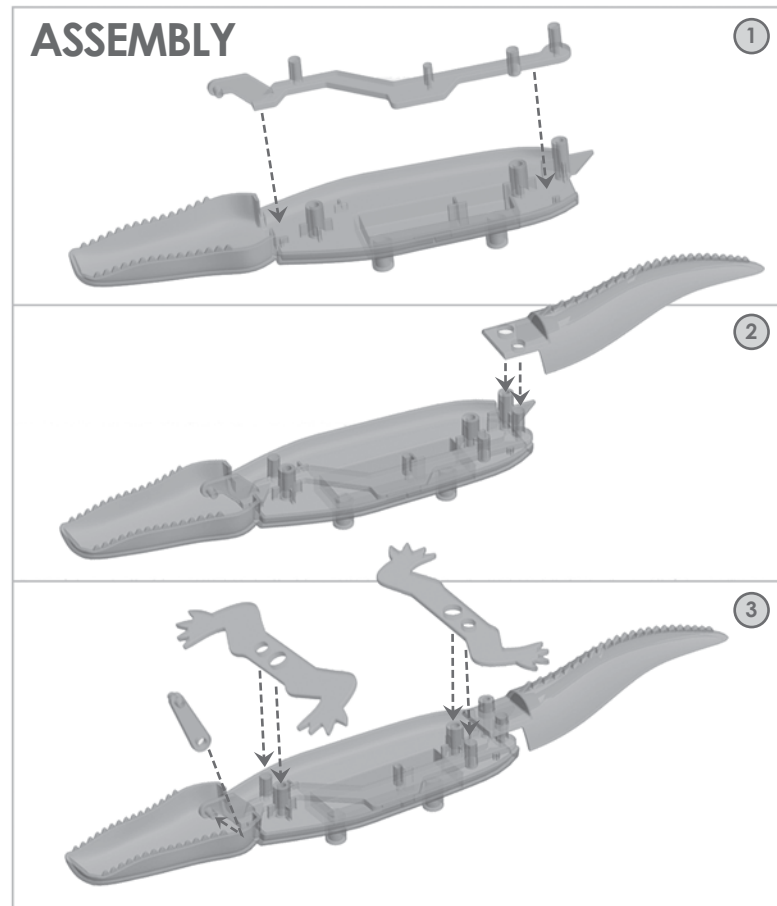
Warning! Do not short-circuit the battery terminals and spring connectors. Doing so may cause overheating.

SAFETY

The metal springs included with your crocodile are flexible, which allows them to be bent so the end of each wire can easily be pushed between the coils. When you wish to disconnect your crocodile, bend the spring again to release the wire. Only insert the exposed metal part of the wire into the metal coil and not the plastic tubing. Plastic is not a conductor, so the circuit will not work unless a metal connection is made, i.e., metals touch each other. The crocodile operates with very low power from one AA battery, but you must still observe safety rules.



ASSEMBLY



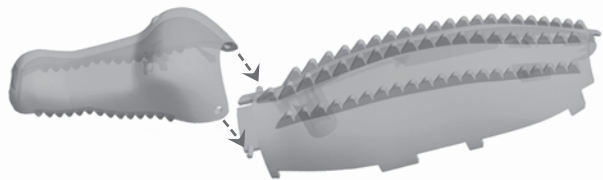
ELECTRICAL SAFETY

NEVER assume a circuit is low voltage.

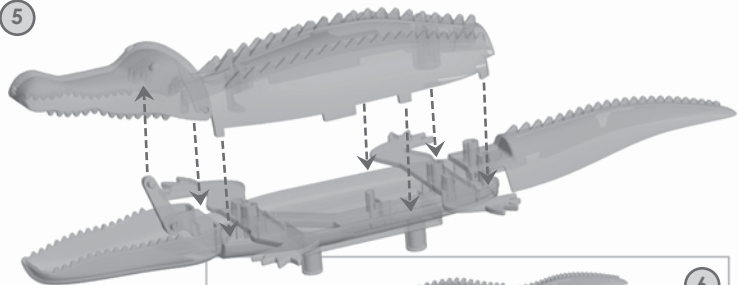
NEVER stick hands or wires into plug sockets or pull at electric wires.

NEVER touch anything electrical with wet hands.

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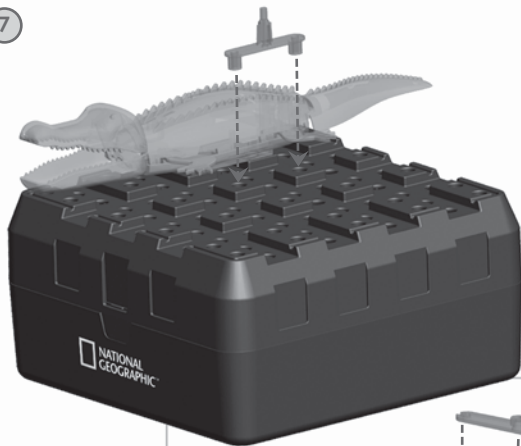
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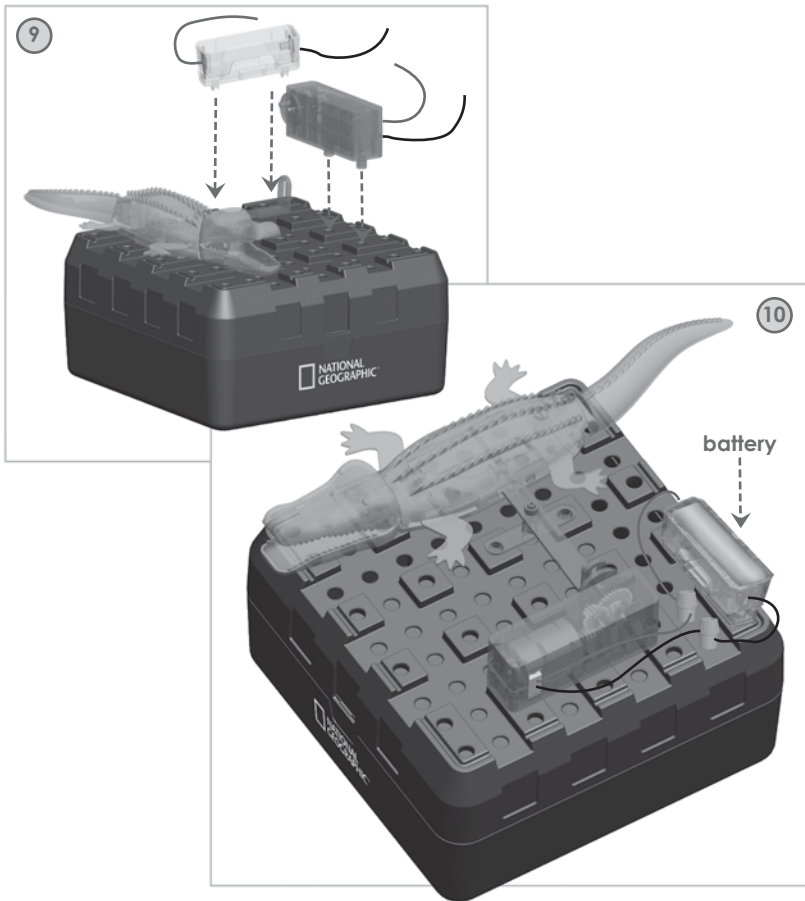


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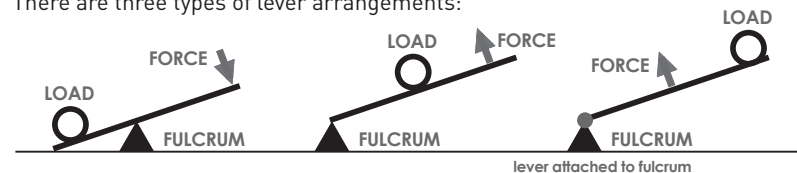
CROCODILE

The crocodile kit demonstrates how one form of energy (electrical) can be translated into another (kinetic). The battery stores electrical energy; by connecting this to the motor unit, it converts the energy, via a simple motor and gearbox, into the circular motion of the drive wheel. The drive wheel has a crank (the small rod sticking out of the wheel); fitting the crank into the end of the lever causes the circular motion to be translated into a reciprocating (back-and-forth) motion.

The lever is fitted between the motor unit and the crocodile in order to transfer the reciprocating motion. This allows the drive motor to be positioned away from the moving parts of the crocodile. An arrangement of smaller connecting levers uses this motion to make the legs, tail and jaw move.

Each moving part is pushed/pulled by a lever or combination of levers. In order to make these work correctly, there is always a fixed point (the fulcrum) around which the parts rotate. Levers are one of the simplest forms of machines, and are the basis of much more complex pieces of equipment.

There are three types of lever arrangements:



GLOSSARY

Electrical energy – the energy caused by the movement of electrons through a conductor (wire).

Kinetic energy – the energy of an object due to its motion.

Lever – a rigid structure that is used to transfer force from one object to another.

Fulcrum – the fixed point around which a lever pivots or turns.

Crank – an arm attached at right angles to a wheel, which translates the circular motion into a reciprocating (back-and-forth) motion.

CROCODILE (*Crocodylus*)

Crocodiles are the largest and the heaviest reptiles living on Earth, and live in the wild in Mexico, America, Australia, Asia and Africa. Living mostly in grassy swamps, lakes and rivers, they eat just about everything they find in the water or along riverbanks. A crocodile can hold its breath underwater for more than an hour, so it can be difficult to spot one; sometimes it appears to look like a log floating in the river. The crocodile's body form allows its eyes, ears and nostrils to remain above the surface of the water, whilst the bulk of its body is hidden under the water. Crocodiles are very efficient hunters, and can swim as fast as 32 kilometres an hour and run on land up to 17.6 kilometres an hour, so it is never wise to underestimate them. Crocodiles do not chew their foods despite the fact that they have powerful jaws with many conical-shaped teeth. They either tear off large pieces of prey and swallow them, or they just swallow their prey whole! Crocodiles can live up to 75 years and the largest confirmed saltwater crocodile (*Crocodylus porosus*) measured 6.3 metres in length! Crocodiles have long, elongated bodies, and their skin is thick, with large bony plates. On land a crocodile usually moves in a slow crawl along the ground, and its whole body moves from side to side in an undulating gait. Crocodiles have short legs compared to the size of their bodies, and clawed, webbed toes. At slow speeds their

bellies and tails actually touch the ground, but as they start to accelerate their movements become more swaggering, like those of a lizard. They raise their bodies from the ground using their legs and feet, and whip their tails left and right. The tail is long and powerful, and is useful when the crocodile is in the water as its main thrust for swimming.



A Nile crocodile (*Crocodylus niloticus*).
Photograph by Beverly Joubert/National Geographic Society.